phthisical sputa and in tubercle, and which is indistinguishable from that organism. In several cases of acute phthisis the search for the organism was unsuccessful, and none were found in the aqueous vapour condensed from the waiting room of the Consumption Hospital in Manchester.

Koch has shown that the dust from dried phthisical sputa is capable of conveying the disease, but the above-mentioned discovery of the bacillus in the breath renders it probable that particles contagious to susceptible individuals are constantly being breathed in with the air, and it is possible that at some future time, the bacillus of tubercle may, by careful cultivation of the vapour of crowded rooms, be obtained from this source.

November 23, 1882.

THE PRESIDENT in the Chair.

In pursuance of the Statutes, notice was given from the Chair of the ensuing Anniversary Meeting, and the list of Officers and Council nominated for election was read, as follows:—

President.—William Spottiswoode, M.A., D.C.L., LL.D.

Treasurer.—John Evans, D.C.L., LL.D.

Secretaries.—{ Professor George Gabriel Stokes, M.A., D.C.L., LL.D.
Professor Michael Foster, M.A., M.D.

Foreign Secretary.—Professor Alexander William Williamson, Ph.D., LL.D.

Other Members of the Council.—Professor W. Grylls Adams, M.A., John Ball, M.A.; Thomas Lauder Brunton, M.D., Sc.D.; Professor Heinrich Debus, Ph.D.; Francis Galton, M.A.; Professor Olaus Henrici, Ph.D.; Professor Thomas Henry Huxley, LL.D.; Professor E. Ray Lankester, M.A.; Professor Joseph Lister, M.D.; Professor Joseph Prestwich, M.A.; Professor Osborne Reynolds, M.A.; Professor Henry Enfield Roscoe, B.A., LL.D.; Marquis of Salisbury, K.G., M.A.; Osbert Salvin, M.A.; Warington W. Smyth, M.A., F.G.S.; Edward James Stone, M.A.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read:—

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I. "Monthly Means of the Highest and Lowest Diurnal Temperatures of the Water of the Thames, and Comparison with the corresponding Temperatures of the Air at the Royal Observatory, Greenwich." By Sir GEORGE BIDDELL AIRY, K.C.B., F.R.S., late Astronomer Royal. Received September 15, 1882.

In presenting to the Royal Society a partial reduction of the thermometrical observations made in the water of the Thames during a period of thirty-five years, I commence with a brief history of the undertaking and progress of this work.

The observations were instituted at the suggestion of the conductors of the Medical Department in the Office of the Registrar-General of Births, Deaths, and Marriages, with the view of supplying some knowledge of an element which may possibly affect the sanitary condition of the Metropolis. The plan of observations was arranged at the Royal Observatory of Greenwich; and the instruments were procured and mounted, and repaired, when necessary, under the care successively of James Glaisher, Esq., and William Ellis, Esq., Superintendents of the Magnetical and Meteorological Department of the Observatory. The self-recording instruments were attached to the Hospital Ships successively anchored in the Thames, nearly opposite to Greenwich: and their records were read and registered by the medical officers of those ships, and these written registers were transmitted every week to the Royal Observatory. And I cannot too strongly express my sense of the care with which the observations were made, the fidelity with which they were recorded, and the order and regularity with which they were transmitted to the Royal Observatory. The weekly register, when received at the Observatory, was combined with the brief record of other meteorological facts observed at the Royal Observatory, and (with the medical record) was published every week by the Registrar-General.

I have been favoured by Mr. Ellis, who, at my request, has kindly superintended the preparation of the results of observations of thermometers in the water of the Thames, with the following remarks on the nature of the observations and the elements for their reduction.

"The observations, from the commencement of the series in May, 1844, until April, 1870, were taken at the 'Dreadnought' Hospital Ship, moored in the river a little above Greenwich. The thermometers were inclosed in an upright wooden trunk attached to the side of the ship, its lower portion projecting into the water; the trunk was closed at the bottom; the closing plate and that portion of the sides which was under water being perforated with holes, to allow the water easily to flow through. The thermometers were suspended in the trunk so as to be about 2 feet below the surface of the water and 1 foot above the bottom of the trunk.

"In 1870, April, the observations at the 'Dreadnought' terminated; in 1871, January, observations were recommenced at the police-ship 'Scorpion,' moored in Blackwall Reach (between Greenwich and Blackwall), the thermometers being mounted in the same way as previously at the 'Dreadnought'; in 1874, May, the wooden trunk and thermometers were removed from the 'Scorpion' to the police-ship 'Royalist,' moored in the same place. In 1879, October, the 'Royalist' was damaged by another vessel coming into collision with her; after repair, the 'Royalist' was not again moored in the river, but was placed on the river bank near high-water mark, in which position no further observations of the temperature of the water could be made. The observations have not, to the present time, been resumed in any other position.

"The instruments employed throughout were one for highest temperature and one for lowest temperature. For highest temperature two constructions have been successively used; the earlier, in which the mercury, with rising temperature, pushes up a steel index, leaving it detached when the temperature falls; the later, in which the column of mercury becomes divided on fall of temperature, the principal portion of the column being left in the tube. For lowest temperature a spirit thermometer was employed, its index being contained within the column of spirit. The index-errors of the two thermometers in use were properly determined, and corrections for them were applied when necessary.

"The thermometers were read every morning at 9 A.M."

In the first steps of publication of these observations in the Greenwich Meteorological Table, given in the Registrar-General's "Weekly Report of Births and Deaths in London," the printed readings, in early years, were referred to the civil day preceding that on which the instruments were actually read; in later years they were referred to the civil day on which the instruments were read.

The observations of atmospheric temperature at the Royal Observatory were made with the maximum and minimum thermometers in ordinary use, at the elevation 4 feet above the ground; readings adopted here are those which correspond to the civil day preceding that on which the Thames thermometers were read.

It will be remarked that the indications of the thermometers in the Thames were read only once in each day. I could have wished that a greater number of readings could have been taken, sufficiently numerous to exhibit the dependence of the temperature of the Thames water upon the phase of the tide. But under the circumstances this was impracticable. To establish a self-registering apparatus was out of the question; and if on a few occasions we had gone through the labour of making observations at every hour of day and night, the conclusions deduced from those few instances might have been vitiated by accidents. But I am able to assert positively, as a result from the reductions to be exhibited in the following pages, that nothing has been lost from the restriction of the plan of observation. It will be seen that the daily change of temperature, produced by the aggregate of strictly diurnal change (depending on the solar hour) and tidal change (depending on the moon's apparent position) is so small, that it is impossible to attach with any certainty a sensible value to either of these causes.

I now proceed to describe the principal steps in the reduction of the observations.

In the weekly publication of these observations by the Registrar-General, the weekly means of each observed element were also exhibited. In preparation for a detailed publication of the whole, I had the entire series of these weekly means collected, each being accompanied with notes of the principal phases of the moon, the occurrence of remarkable storms, &c., occurring within the week. (This *résumé* exists, and is available for any discussion which might be suggested; I propose to offer it for deposit at the Royal Observatory.) But on general examination of the collected means, I did not perceive that any result could be expected which would justify the labour and expense of printing the whole. For instance, if there were any remarkable dependence on the phase of tide, different values for the "excess of mean temperature of the water above mean temperature of the air," would occur in the weeks which included respectively new moon, first quarter, full moon, third quarter; and these would recur with little alteration for several months. But on general examination I do not see anything which would justify more technical discussion directed to this point. Finally, I decided on exhibiting only the means of deductions as to temperature for each calendar month, and omitting all other phenomena. As the succession of weeks and the succession of entire months do not generally coincide, the rule was established, to adopt the first entire week in each calendar month as the first of the weeks to be used, in conjunction with three or four weeks following, to form the monthly mean. Thus, some months contain four weeks and some contain five weeks. For instance, the month of 1846, March, contains the five weeks, March 1—7, 8—14, 15—21, 21—28, 28—April 4; but the next month contains only the four weeks, April 5—11, 12—18, 19—25, 26—May 2.

By this system, the results, as far as they appear to possess any value, are brought into the compass of five convenient tables of double entry, which, with their columnar and lateral means, appear to give all the information that can be desired. The contents of the several tables are:—

Table I.—Monthly Mean Temperature of the Water of the Thames.

Table II.—Monthly Mean Atmospheric Temperature at the Royal Observatory.

Table III.—Monthly Mean Excess of Thames Temperature above Observatory Atmospheric Temperature.

Table IV.—Monthly Mean of Diurnal Range of Temperature of the Water of the Thames.

Table V.—Monthly Mean of Diurnal Range of Atmospheric Temperature at the Royal Observatory.

And the following appear to be the legitimate epitomized inferences:

(1.) The mean temperature of the Thames water is higher than that of the Observatory thermometers by 1°·5. But the locality of the Observatory thermometer is, in hypsometrical elevation, about 160 feet above that of the Thames thermometers. It would seem probable, therefore, that the mean temperature of the water is higher than the climatic temperature by only a small fraction of a degree.

(2.) This difference is not uniform through the year. With some irregularities, the greatest excess of Thames temperature occurs in October and the least in February. But the autumnal difference exceeds the spring difference by only 1°·8. It seems not improbable that this is the effect of a slight communication with the sea, whose surface-waters have accumulated in autumn the effect of solar radiation through the summer; with contrary effect at the opposite season.

(3.) The mean range of temperature through the day is 2°·1, and this expresses the numerical change from the lowest solar temperature, or the lowest temperature in the first tide, or the lowest temperature in the second tide (whichever may be the lowest), to the highest solar temperature, or the highest temperature in the first tide, or the highest temperature in the second tide (whichever may be the highest). It is evident that the change of temperature due to the diurnal change of solar action, and the change of temperature due to each of the tides, must each, individually, be very small.

(4.) It appears to me that the fundamental inference must be this: that the material water is very little changed at Greenwich by the tide. Although a vast body of water rushes up at every flow, running with great speed, and sometimes raising the surface by 20 feet, yet nearly the same water runs down at ebb, and is again brought up, with all its contents, at the next flow. These expressions are to be taken as modified by the descent of fresh water from the land; but the amount of that water must be small in comparison with the mass which it joins in the Thames at London.

(5.) I do not imagine that the tidal action has any beneficial effect on the climate of London, except that probably the agitation of the water produces mechanical agitation of the air, and thus destroys injurious stagnation.

Table I.—Monthly Mean Temperature of the Water of the Thames at Greenwich.

Year.	Month.												Sums.	Means.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
	°	°	°	°	°	°	°	°	°	°	°	°	°	°
1844														
1845	39·3	34·4	38·8	49·6	52·9	63·0	63·6	60·1	56·8	50·9	46·1	40·6	596·1	49·7
1846	43·3	43·9	47·4	50·9	60·4	73·1	67·1	67·1	65·9	51·9	44·4	36·9	652·3	54·4
1847	36·5	38·2	42·9	47·1	59·4	63·2	68·9	64·6	56·2	52·8	46·5	41·4	617·7	51·5
1848	35·5	42·7	46·3	51·7	64·2	63·1	65·5	62·1	59·4	52·3	42·9	41·0	626·7	52·2
1849	41·8	43·5	45·2	47·9	58·2	64·1	67·5	63·9	59·3	50·1	44·8	37·3	623·6	52·0
1850	33·0	41·6	41·5	49·4	54·0	63·8	64·8	63·3	57·5	48·4	46·3	39·6	603·2	50·3
1851	41·0	40·1	42·8	49·7	54·3	61·9	65·0	65·7	58·9	54·6	41·3	41·5	616·8	51·4
1852	40·9	41·0	42·2	48·3	55·5	61·2	70·6	66·2	60·1	48·6	46·7	46·3	627·6	52·3
1853	40·0	37·1	42·4	48·6	55·5	62·6	63·4	62·3	58·1	53·5	43·5	38·0	605·0	50·4
1854	39·1	41·3	46·2	52·1	56·1	59·4	64·8	63·8	62·9	53·6	44·7	41·8	625·8	52·1
1855	39·9	34·6	41·4	49·1	53·2	59·7	66·4	66·1	60·9	54·1	44·2	38·5	608·1	50·7
1856	40·5	42·4	43·5	50·7	54·0	63·0	65·4	66·6	58·2	54·5	44·1	42·6	625·5	52·1
1857														
1858	39·2	37·8	41·7	50·0	56·5	67·9	65·1	65·4	62·1	56·7	42·1	41·9	626·4	52·2
1859	41·4	44·8	47·9	49·7	55·3	65·4	71·1	67·2	61·2	60·2	44·7	38·8	647·7	54·0
1860	40·8	36·9	42·9	47·0	56·9	58·8	62·5	60·8	57·6	51·1	45·3	39·8	600·4	50·0
1861	35·0	43·1	44·9	49·4	56·5	63·4	65·3	65·7	61·1	57·0	43·7	41·4	626·5	52·2
1862	39·7	43·4	46·4	51·0	58·3	60·2	62·5	63·4	60·0	54·7	43·6	42·7	625·9	52·2
1863	41·2	43·2	45·6	53·1	56·5	63·1	66·2	65·3	60·2	54·8	48·1	43·5	640·8	53·4
1864	39·8	37·5	43·7	50·5	58·8	61·7	66·0	63·2	60·5	52·9	44·4	42·5	621·5	51·8
1865	38·5	38·2	39·6	53·9	60·6	65·7	65·7	64·3	65·9	54·0	43·9	43·1	633·4	52·8
1866	42·2	39·3	41·8	50·6	53·7	62·9	65·2	61·5	58·2	53·7	44·7	41·5	615·3	51·3
1867	35·1	44·2	40·5	49·9	55·2	62·0	62·7	63·7	59·6	49·7	43·5	36·8	602·9	50·2
1868	37·6	41·5	45·9	50·0	59·6	64·5	68·3	65·1	60·2	50·4	43·3	43·8	630·2	52·5
1869	41·6	44·4	40·4	51·1	53·9	57·2	65·1	62·4	57·9	51·1	42·8	37·9	605·8	50·5
1870														
1871	35·9	41·8	45·6	49·6	55·1	58·8	63·8	66·6	61·1	51·9	41·3	37·7	609·2	50·8
1872	40·2	44·5	47·0	51·7	54·7	62·6	68·1	65·1	60·5	50·3	45·8	42·0	632·5	52·7
1873	41·9	36·6	43·5	49·2	53·9	61·3	66·4	65·1	57·7	52·7	44·4	42·4	615·1	51·3
1874	41·1	40·3	44·3	51·3	56·1	62·7	67·5	63·0	60·0	54·4	49·3	34·4	624·4	52·0
1875	41·2	38·1	43·1	48·9	59·0	62·8	62·7	66·1	63·2	51·2	42·5	38·9	617·7	51·5
1876	39·4	42·1	42·2	50·1	54·1	61·9	67·9	66·9	59·2	55·5	46·0	43·2	628·5	52·4
1877	42·9	44·3	42·6	49·2	53·5	64·0	65·0	65·8	57·8	51·6	47·1	41·4	625·2	52·1
1878	41·1	42·5	45·4	51·0	59·4	62·5	67·7	66·1	60·2	54·7	42·2	36·5	629·3	52·4
1879	33·9	38·8	43·3	47·2	52·3	59·8	60·7	62·3	58·2	53·0	39·3	35·9	584·7	48·7
Sums	1300·5	1344·1	1438·9	1649·5	1857·6	2067·3	2168·5	2126·8	1976·6	1746·9	1463.5	1331·6	20471·8	
Means	39·4	40·7	43·6	50·0	56·3	62·6	65·7	64·4	59·9	52·9	44·3	40·4	...	51·7

During the years 1844, 1857, and 1870 the observations were incomplete, the results for those years have in consequence been altogether omitted. The monthly values *in different figures* are estimations, inserted in order to complete the numbers for the particular years in which they occur, for the purpose of taking means.

Table II.—Monthly Mean Atmospheric Temperature at the Royal Observatory, Greenwich.

Year.	Month.												Sums.	Means.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
	°	°	°	°	°	°	°	°	°	°	°	°	°	°
1844														
1845	38·2	32·8	37·0	48·6	49·4	61·0	59·8	57·3	53·9	48·7	45·0	41·1	572·8	47·7
1846	44·7	44·1	44·3	47·7	56·7	68·3	68·0	63·4	63·3	49·9	41·8	36·1	628·3	52·4
1847	35·7	36·0	42·5	46·5	58·1	57·8	66·6	61·2	54·9	52·6	46·0	41·2	599·1	49·9
1848	35·8	44·0	45·3	49·1	58·6	60·2	62·4	59·2	56·9	50·6	43·4	41·2	606·7	50·6
1849	42·5	43·3	43·2	46·3	55·9	58·6	63·6	64·7	58·5	51·5	43·3	38·1	609·5	50·8
1850	34·6	44·6	42·1	49·7	53·6	61·7	63·6	61·0	56·3	47·5	46·1	41·4	602·2	50·2
1851	42·3	40·7	43·9	45·6	52·0	59·4	62·0	63·1	56·1	52·6	38·3	40·2	596·2	49·7
1852	42·9	40·7	42·5	46·8	53·0	59·7	69·5	63·7	56·7	50·2	47·5	48·1	621·3	51·8
1853	37·7	34·1	40·3	46·7	53·0	60·2	61·4	60·3	56·1	52·7	40·5	33·7	576·7	48·1
1854	39·3	40·7	46·3	50·2	53·6	58·3	61·9	63·3	59·5	50·6	40·3	42·6	606·6	50·5
1855	32·1	29·0	38·4	47·1	51·6	58·9	63·7	63·2	57·9	49·8	42·0	36·5	570·2	47·5
1856	38·5	43·1	41·0	46·9	51·8	60·1	64·1	63·5	57·1	51·9	40·0	41·8	599·8	50·0
1857														
1858	37·8	34·5	44·2	48·4	55·4	65·7	63·3	63·7	61·3	52·0	39·8	40·3	606·4	50·5
1859	40·4	46·4	46·2	48 5	55·2	63·3	69·0	64·8	58·1	56·6	40·3	37·0	625·8	52·2
1860	39·4	37·0	42·3	45·8	55·6	56·8	60·6	59·2	54·3	50·4	40·8	37·7	579·9	48·3
1861	35·5	44·1	45·0	45·9	57·0	61·2	63·2	64 8	59·4	54·1	40·7	40·9	611·8	51·0
1862	37·9	41·2	45·3	50·1	57·4	58·3	61·5	60·4	58·9	52·3	40·8	42·8	606·9	50·6
1863	41·7	42 7	44·7	51·1	55·1	60·4	61·8	63·0	54·1	52·2	45·5	41·7	614·0	51·2
1864	37·2	36·7	42·3	48·1	54·7	60·2	65·8	59·5	57·8	51·6	43·4	40·8	598·1	49·8
1865	37·1	37·1	37·4	54·6	57·2	62·0	63·8	62·5	65·0	51·3	45·7	42·4	616·1	51·3
1866	41·9	39·3	42·5	50·1	53·2	62·7	62·6	60·7	57·9	50·7	42·9	39·7	604·2	50·4
1867	37·1	44·4	41·2	50·9	55·1	60·2	59·8	64·3	58·3	50·0	41·2	37·9	600·4	50·0
1868	38·8	43·2	45·4	50·1	58·7	64·5	69·3	65·3	59·3	48·3	42·5	44·9	630·3	52·5
1869	42·7	43·9	39·2	52·7	53·1	57·0	66·3	61·7	61·0	48·9	40·6	38·8	605·9	50·5
1870														
1871	33·9	44·1	45·8	50·0	53·7	57·8	63·3	67·5	58·3	49·9	36·5	39·2	600·0	50·0
1872	41·8	46·0	45·1	51·5	52·1	61·8	66·1	62·8	58·0	48·2	45·5	43·2	622·1	51·8
1873	41·5	35·3	44·3	48·2	52·1	61·0	65·5	63·2	56·2	46·9	44·2	40·1	598·5	49·9
1874	41·6	39·2	45·0	51·6	54·5	59·5	66·4	61·5	58·6	52·4	45·3	30·6	606·2	50·5
1875	42·7	35·3	42·6	47·6	57·5	60·4	60·0	64·0	60·7	48·7	39·4	39·9	598·8	49·9
1876	37·3	42·4	41·6	48·2	52·2	60·5	67·1	64·9	57·1	52·3	44·6	43·9	612·1	51·0
1877	42·0	43·5	41·5	46·2	52·4	63·2	62·2	63·6	53·3	48·6	45·2	41·0	602·7	50·2
1878	39·3	43·4	42·0	52·1	56·0	61·2	64·7	64·3	57·6	50·6	39·5	33·5	604·2	50·3
1879	30·9	38·8	42·6	44·0	49·9	58·2	60·2	60·6	56·8	48·8	36·3	34·9	562·0	46·8
Sums	1282·8	1331·6	1413·0	1606·9	1795·4	2000·1	2109·1	2066·2	1909·2	1673·4	1394·9	1313·2	19895·8	
Means	38·9	40·4	42·8	48·7	54·4	60·6	63·9	62·6	57·9	50·7	42·3	39·8	...	50·2

The results for the years 1844, 1857, and 1870 have been omitted, in order to render the table entirely comparative with that giving the Thames temperatures.

Table III.—Monthly Mean Excess of Thames Temperature at Greenwich, over Atmospheric Temperature at Royal Observatory, Greenwich.

Year.	Month.												Sums.	Means.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
	°	°	°	°	°	°	°	°	°	°	°	°	°	°
1844														
1845	+ 1·1	+ 1·6	+ 1·8	+ 1·0	+ 3·5	+ 2·0	+ 3·8	+ 2·8	+ 2·9	+ 2·2	+ 1·1	− 0·5	+ 23·3	+1·9
1846	− 1·4	− 0·2	+ 3·1	+ 3·2	+ 3·7	+ 4·8	− 0·9	+ 3·7	+ 2·6	+ 2·0	+ 2·6	+ 0·8	+ 24·0	+2·0
1847	+ 0·8	+ 2·2	+ 0·4	+ 0·6	+ 1·3	+ 5·4	+ 2·3	+ 3·4	+ 1·3	+ 0·2	+ 0·5	+ 0·2	+ 18·6	+1·6
1848	− 0·3	− 1·3	+ 1·0	+ 2·6	+ 5·6	+ 2·9	+ 3·1	+ 2·9	+ 2·5	+ 1·7	− 0·5	− 0·2	+ 20·0	+1·7
1849	− 0·7	+ 0·2	+ 2·0	+ 1·6	+ 2·3	+ 5·5	+ 3·9	− 0·8	+ 0·8	− 1·4	+ 1·5	− 0·8	+ 14·1	+1·2
1850	− 1·6	− 3·0	− 0·6	− 0·3	+ 0·4	+ 2·1	+ 1·2	+ 2·3	+ 1·2	+ 0·9	+ 0·2	− 1·8	+ 1·0	+0·1
1851	− 1·3	− 0·6	− 1·1	+ 4·1	+ 2·3	+ 2·5	+ 3·0	+ 2·6	+ 2·8	+ 2·0	+ 3·0	+ 1·3	+ 20·6	+1·7
1852	− 2·0	+ 0·3	− 0·3	+ 1·5	+ 2·5	+ 1·5	+ 1·1	+ 2·5	+ 3·4	− 1·6	− 0·8	− 1·8	+ 6·3	+0·5
1853	+ 2·3	+ 3·0	+ 2·1	+ 1·9	+ 2·5	+ 2·4	+ 2·0	+ 2·0	+ 2·0	+ 0·8	+ 3·0	+ 4·3	+ 28·3	+2·4
1854	− 0·2	+ 0·6	− 0·1	+ 1·9	+ 2·5	+ 1·1	+ 2·9	+ 0·5	+ 3·4	+ 3·0	+ 4·4	− 0·8	+ 19·2	+1·6
1855	+ 7·8	+ 5·6	+ 3·0	+ 2·0	+ 1·6	+ 0·8	+ 2·7	+ 2·9	+ 3·0	+ 4·3	+ 2·2	+ 2·0	+ 37·9	+3·2
1856	+ 2·0	− 0·7	+ 2·5	+ 3·8	+ 2·2	+ 2·9	+ 1·3	+ 3·1	+ 1·1	+ 2·6	+ 4·1	+ 0·8	+ 25·7	+2·1
1857														
1858	+ 1·4	+ 3·3	− 2·5	+ 1·6	+ 1·1	+ 2·2	+ 1·8	+ 1·7	+ 0·8	+ 4·7	+ 2·3	+ 1·6	+ 20·0	+1·7
1859	+ 1·0	− 1·6	+ 1·7	+ 1·2	+ 0·1	+ 2·1	+ 2·1	+ 2·4	+ 3·1	+ 3·6	+ 4·4	+ 1·8	+ 21·9	+1·8
1860	+ 1·4	− 0·1	+ 0·6	+ 1·2	+ 1·3	+ 2·0	+ 1·9	+ 1·6	+ 3·3	+ 0·7	+ 4·5	+ 2·1	+ 20·5	+1·7
1861	− 0·5	− 1·0	− 0·1	+ 3·5	− 0·5	+ 2·2	+ 2·1	+ 0·9	+ 1·7	+ 2·9	+ 3·0	+ 0·5	+ 14·7	+1·2
1862	+ 1·8	+ 2·2	+ 1·1	+ 0·9	+ 0·9	+ 1·9	+ 1·0	+ 3·0	+ 1·1	+ 2·4	+ 2·8	− 0·1	+ 19·0	+1·6
1863	− 0·5	+ 0·5	+ 0·9	+ 2·0	+ 1·4	+ 2·7	+ 4·4	+ 2·3	+ 6·1	+ 2·6	+ 2·6	+ 1·8	+ 26·8	+2·2
1864	+ 2·6	+ 0·8	+ 1·4	+ 2·4	+ 4·1	+ 1·5	+ 0·2	+ 3·7	+ 2·7	+ 1·3	+ 1·0	+ 1·7	+ 23·4	+2·0
1865	+ 1·4	+ 1·1	+ 2·2	− 0·7	+ 3·4	+ 3·7	+ 1·9	+ 1·8	+ 0·9	+ 2·7	− 1·8	+ 0·7	+ 17·3	+1·4
1866	+ 0·3	0·0	− 0·7	+ 0·5	+ 0·5	+ 0·2	+ 2·6	+ 0·8	+ 0·3	+ 3·0	+ 1·8	+ 1·8	+ 11·1	+0·9
1867	− 2·0	− 0·2	− 0·7	− 1·0	+ 0·1	+ 1·8	+ 2·9	− 0·6	+ 1·3	− 0·3	+ 2·3	− 1·1	+ 2·5	+0·2
1868	− 1·2	− 1·7	+ 0·5	− 0·1	+ 0·9	0·0	− 1·0	− 0·2	+ 0·9	+ 2·1	+ 0·8	− 1·1	− 0·1	0·0
1869	− 1·1	+ 0·5	+ 1·2	− 1·6	+ 0·8	+ 0·2	− 1·2	+ 0·7	− 3·1	+ 2·2	+ 2·2	− 0·9	− 0·1	0·0
1870														
1871	+ 2·0	− 2·3	− 0·2	− 0·4	+ 1·4	+ 1·0	+ 0·5	− 0·9	+ 2·8	+ 2·0	+ 4·8	− 1·5	+ 9·2	+0·8
1872	− 1·6	− 1·5	+ 1·9	+ 0·2	+ 2·6	+ 0·8	+ 2·0	+ 2·3	+ 2·5	+ 2·1	+ 0·3	− 1·2	+ 10·4	+0·9
1873	+ 0·4	+ 1·3	− 0·8	+ 1·0	+ 1·8	+ 0·3	+ 0·9	+ 1·9	+ 1·5	+ 5·8	+ 0·2	+ 2·3	+ 16·6	+1·4
1874	− 0·5	+ 1·1	− 0·7	− 0·3	+ 1·6	+ 3·2	+ 1·1	+ 1·5	+ 1·4	+ 2·0	+ 4·0	+ 3·8	+ 18·2	+1·5
1875	− 1·5	+ 2·8	+ 0·5	+ 1·3	+ 1·5	+ 2·4	+ 2·7	+ 2·1	+ 2·5	+ 2·5	+ 3·1	− 1·0	+ 18·9	+1·6
1876	+ 2·1	− 0·3	+ 0·6	+ 1·9	+ 1·9	+ 1·4	+ 0·8	+ 2·0	+ 2·1	+ 3·2	+ 1·4	− 0·7	+ 16·4	+1·4
1877	+ 0·9	+ 0·8	+ 1·1	+ 3·0	+ 1·1	+ 0·8	+ 2·8	+ 2·2	+ 4·5	+ 3·0	+ 1·9	+ 0·4	+ 22·5	+1·9
1878	+ 1·8	− 0·9	+ 3·4	− 1·1	+ 3·4	+ 1·3	+ 3·0	+ 1·8	+ 2·6	+ 4·1	+ 2·7	+ 3·0	+ 25·1	+2·1
1879	+ 3·0	0·0	+ 0·7	+ 3·2	+ 2·4	+ 1·6	+ 0·5	+ 1·7	+ 1·4	+ 4·2	+ 3·0	+ 1·0	+ 22·7	+1·9
Sums.	+17·7	+12·5	+25·9	+42·6	+62·2	+67·2	+59·4	+60·6	+67·4	+73·5	+68·6	+18·4	+576·0	
Means	+0·5	+0·4	+0·8	+1·3	+1·9	+2·0	+1·8	+1·8	+2·0	+2·2	+2·1	+0·6	...	+1·5

During the years 1844, 1857, and 1870 the observations of Thames temperature were incomplete, the results for those years have in consequence been altogether omitted. The monthly values in *different figures* are estimations, inserted in order to complete the numbers for the particular years in which they occur for the purpose of taking means.

Table IV.—Monthly Mean of the Diurnal Range of the Temperature of the Water of the Thames at Greenwich.

Year.	Month.												Sums.	Means.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
	°	°	°	°	°	°	°	°	°	°	°	°	°	°
1844														
1845	0·8	0·4	1·0	1·0	0·5	0·8	0·3	0·4	0·4	0·4	1·1	2·1	9·2	0·8
1846	2·2	2·7	1·9	2·1	2·8	1·3	1·3	1·7	1·5	1·5	2·2	2·6	23·8	2·0
1847	1·6	1·5	0·6	0·7	2·1	3·6	4·1	1·6	0·4	0·4	0·7	1·1	18·4	1·5
1848	1·0	1·5	1·5	1·1	1·3	0·9	1·0	1·1	1·0	2·9	2·5	3·4	19·2	1·6
1849	1·6	1·6	1·5	3·7	3·0	2·3	2·2	2·1	2·8	3·2	3·1	3·5	30·6	2·5
1850	2·7	3·1	3·3	3·3	4·2	4·0	3·5	3·4	3·1	3·3	3·5	3·4	40·8	3·4
1851	3·6	3·7	3·5	3·5	4·4	3·8	2·0	2·1	2·3	2·0	2·7	2·7	36·3	3·0
1852	2·3	2·7	2·0	2·0	2·0	2·6	2·7	3·3	3·0	1·0	1·7	1·5	26·8	2·2
1853	0·6	0·9	2·4	1·8	2·5	2·1	2·2	2·5	2·0	1·7	1·5	1·3	21·5	1·8
1854	1·0	1·8	2·7	3·4	3·4	3·4	3·1	3·2	3·2	2·9	2·0	1·5	31·6	2·6
1855	2·7	1·5	2·0	2·5	2·6	3·4	2·9	2·1	3·0	2·7	3·2	2·7	31·3	2·6
1856	1·7	1·9	1·2	3·0	3·0	3·6	2·8	2·6	2·6	2·6	1·5	1·9	28·4	2·4
1857														
1858	0·7	0·8	1·0	3·2	3·5	2·2	3·0	2·8	1·8	1·3	0·2	0·0	20·5	1·7
1859	0·0	0·3	0·5	0·8	1·7	1·9	1·9	1·3	1·3	1·1	0·1	0·0	10·9	0·9
1860	0·9	1·8	1·8	1·1	1·6	1·0	1·0	1·0	1·0	1·0	1·0	1·0	14·2	1·2
1861	1·0	1·0	1·0	1·0	1·0	1·0	1·0	1·0	1·5	2·0	5·9	3·9	21·3	1·8
1862	3·0	2·3	2·8	2·2	2·2	2·2	2·1	2·2	2·2	2·3	2·3	3·0	28·8	2·4
1863	2·7	2·5	2·5	2·1	2·2	2·2	2·2	2·2	2·2	2·2	2·2	2·2	27·4	2·3
1864	3·2	3·2	2·2	3·1	2·5	1·9	2·0	1·9	2·2	2·2	1·3	1·3	27·0	2·3
1865	1·6	1·7	1·0	1·0	1·2	1·0	0·5	0·3	0·5	0·3	1·8	1·3	12·2	1·0
1866	2·2	2·0	1·0	1·2	1·1	1·2	0·9	0·8	0·7	1·9	2·2	2·3	17·5	1·5
1867	2·4	2·4	2·8	2·6	2·1	1·8	2·0	1·9	1·8	2·2	2·2	2·0	26·2	2·2
1868	1·6	1·3	1·6	1·8	1·5	1·4	0·5	1·3	1·1	1·5	1·6	1·8	17·0	1·4
1869	1·7	1·8	1·5	2·3	2·1	1·9	2·2	1·6	1·8	1·4	1·4	2·0	21·7	1·8
1870														
1871	3·0	3·5	3·1	3·8	4·1	3·1	3·5	3·0	3·6	2·7	3·3	2·7	39·4	3·3
1872	2·2	2·0	2·7	2·8	2·2	2·8	2·9	2·5	2·3	2·3	2·4	2·1	29·2	2·4
1873	2·1	2·0	2·4	2·7	3·1	2·5	2·1	1·9	1·9	2·4	3·0	2·3	28·4	2·4
1874	2·3	2·4	2·7	3·1	2·3	1·8	1·8	1·9	1·8	1·8	1·9	2·1	25·9	2·2
1875	2·6	2·0	1·9	2·2	2·4	1·8	1·7	1·6	1·7	2·0	1·8	1·8	23·5	2·0
1876	2·2	1·8	1·8	2·7	2·7	2·8	2·5	2·5	2·1	2·4	2·4	2·1	28·0	2·3
1877	2·4	1·9	2·3	2·2	2·7	2·5	2·1	1·9	1·7	2·0	2·0	2·1	25·8	2·2
1878	2·3	2·1	2·3	2·6	2·3	2·3	2·5	2·5	2·6	2·6	2·3	2·5	28·9	2·4
1879	1·8	2·3	2·3	2·7	3·2	3·1	2·6	2·8	2·1	2·9	2·5	2·5	30·8	2·6
Sums	63·7	64·4	64·8	75·3	79·5	74·2	69·1	65·0	63·2	65·1	69·5	68·7	822·5	
Means	1·9	2·0	2·0	2·3	2·4	2·2	2·1	2·0	1·9	2·0	2·1	2·1	...	2·1

During the years 1844, 1857, and 1870 the observations were incomplete, the results for those years have, in consequence, been altogether omitted. The monthly values in *different figures* are estimations, inserted in order to complete the numbers for the particular years in which they occur, for the purpose of taking means.

Table V.—Monthly Mean of the Diurnal Range of Atmospheric Temperature at the Royal Observatory, Greenwich.

Year.	Month.												Sums.	Means.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
	°	°	°	°	°	°	°	°	°	°	°	°	°	°
1844														
1845	7·2	9·4	15·1	15·8	13·9	18·0	14·1	14·5	16·9	13·6	10·7	10·0	159·2	13·3
1846	7·0	7·8	12·3	13·2	19·0	23·3	20·8	16·5	19·0	9·6	7·3	6·3	162·1	13·5
1847	7·6	10·1	15·9	15·3	19·2	14·4	21·5	17·7	15·6	12·0	11·0	6·8	167·1	13·9
1848	8·1	10·9	15·0	19·3	27·0	18·2	20·6	17·1	20·1	14·1	13·4	9·9	193·7	16·1
1849	11·6	14·5	13·2	16·9	15·4	20·6	24·5	19·7	16·6	15·4	12·5	9·2	190·1	15·8
1850	8·8	11·4	16·2	17·3	18·9	23·2	19·5	18·9	17·0	14·0	11·4	8·5	185·1	15·4
1851	10·3	13·4	12·3	16·7	20·3	21·6	17·9	19·8	20·2	13·1	11·3	8·1	185·0	15·4
1852	11·7	13·3	16·3	23·6	18·9	18·4	25·5	18·6	16·5	14·6	9·7	9·2	196·3	16·4
1853	8·7	10·6	16·3	14·1	20·0	19·0	16·1	18·1	18·6	14·7	12·4	8·9	177·5	14·8
1854	11·2	15·5	19·5	22·4	20·1	19·0	20·6	22·8	25·3	17·4	12·1	10·2	216·1	18·0
1855	8·1	10·0	14·5	21·6	17·1	20·8	19·1	19·5	19·8	12·5	9·3	9·8	182·1	15·2
1856	8·6	10·0	13·8	18·5	16·6	20·8	20·8	18·9	15·9	13·9	12·3	9·1	179 2	14·9
1857														
1858	11·6	11·5	18·6	19·7	21·5	25·1	22·5	22·8	18·8	15·6	11·7	8·2	207·6	17·3
1859	10·5	15·7	13·7	17·7	19·6	21·0	24·4	21·1	17·9	13·9	13·3	10·0	198·8	16·6
1860	9·8	14·1	13·9	19·1	19·9	16·5	19·0	15·6	18·2	14·1	10·6	7·9	178·7	14·9
1861	11·0	11·1	16·1	18·7	22·0	19·7	18·9	21·8	19·5	15·8	13·2	10·5	198·3	16·5
1862	9·4	10·1	11·7	16·8	18·5	18·1	20·5	19·1	17·0	14·4	11·1	9·5	176·2	14·7
1863	10·5	13·8	19·0	20·8	21·9	19·1	25·3	19·5	17·0	13·0	11·3	10·9	202·1	16·8
1864	9·9	11·1	15·8	16·1	19·5	20·8	25·6	23·5	17·8	14·2	12·1	9·2	195·6	16·3
1865	8·6	10·6	12·7	24·9	20·8	24·1	21·3	19·5	23·0	16·9	13·8	9·1	205·3	17·1
1866	11·2	12·5	14·0	18·5	21·0	21·2	19·8	17·0	13·1	13·5	12·2	11·3	185·3	15·4
1867	10·1	11·0	12·7	16·6	20·2	20·7	19·9	20·3	17·7	15·2	11·8	10·0	186·2	15·5
1868	9·0	13·1	16·8	18·5	24·3	25·3	27·3	21·0	18·2	17·2	10·4	9·7	210·8	17·6
1869	10·2	12·3	12·6	19·9	17·7	20·7	23·2	20·1	15·2	15·1	11·0	8·7	186·7	15·6
1870														
1871	8·0	13·2	17·2	17·8	22·2	18·1	19·6	25·4	16·8	15·5	10·9	8·3	193·0	16·1
1872	9·3	12·6	15·9	20·9	19·2	21·9	22·5	20·7	18·9	15·1	9·6	8·4	195·0	16·2
1873	8·6	8·7	16·6	19·7	19·7	19·0	23·5	19·6	19·4	16·1	10·8	10·7	192·4	16·0
1874	11·2	11·5	15·9	21·4	23·4	21·5	25·4	21·7	18·0	13·5	12·7	7·9	204·1	17·0
1875	9·4	9·2	13·9	20·4	22·7	20·0	17·8	20·0	18·5	12·7	9·7	8·9	183·2	15·3
1876	11·3	10·6	14·5	19·5	22·1	21·7	24·9	23·4	16·8	12·8	10·1	7·7	195·4	16·3
1877	11·7	11·2	14·0	15·2	17·0	25·5	20·5	19·0	19·3	16·8	12·1	9·6	191·9	16·0
1878	9·7	9·6	14·7	17·5	17·5	20·4	19·7	17·3	18·6	12·7	9·1	8·9	175·7	14·6
1879	6·2	8·7	14·9	16·1	18·2	17·2	16·0	17·1	15·0	12·8	10·6	9·9	162·7	13·6
Sums	316·1	379·1	495·6	610·5	655·3	674·9	698·6	647·6	596·2	471·8	371·5	301·3	6218·5	
Means	9·6	11·5	15·0	18·5	19·9	20·5	21·2	19·6	18·1	14·3	11·3	9·1	...	15·7

The results for the years 1844, 1857, and 1870, have been omitted, in order to render the table entirely comparative with that giving ranges of Thames temperature.